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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/603,939	06/27/2000	David L. Graumann	81674-265759	4441

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EXAMINER

MICHALSKI, JUSTIN I

ART UNIT PAPER NUMBER

2644

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/603,939

Applicant(s)

GRAUMANN, DAVID L.

Examiner

Justin Michalski

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's remarks filed 26 July 2004 regarding the restriction requirement mailed 30 June 2004 is found persuasive. Therefore, the restriction requirement is withdrawn. Currently claims 1-29 are pending.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 4, 5, 7-10, 12, 13, 16-19, 21-26, 28, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Neubauer et al. ("Neubauer") (US Patent 6,584,138).

Regarding Claims 1 and 9, Neubauer discloses a method and apparatus for generating an enhanced acoustic transmission signal (Fig. 1), the method and system comprising: generating a carrier signal ($\cos \omega_T t$); receiving data and generating a data signal representing the data (104); modulating the carrier signal with the data signal to form a modulated carrier signal at a carrier frequency (modulator 110); generating a masking signal to mask the modulated carrier signal from being audible by a human ear (106); receiving audio and generating an audio signal based on the audio (Input to 100), wherein a frequency band surrounding the carrier frequency is removed from the audio

signal (Neubauer discloses dictating which energy level the signal may be applied to remain non-audible, Col. 10, lines 50-55); and combining the modulated carrier signal, the masking signal, and the audio signal to form the enhanced acoustic transmission signal (112).

Regarding Claims 2 and 10, Neubauer discloses the carrier signal is a sine wave ($\cos \omega_T t$).

Regarding Claims 4 and 12, Neubauer discloses the masking signal is narrowband random noise (Col 10, lines 61-64).

Regarding Claims 5 and 13, Neubauer discloses the modulated carrier signal is at a level that is detectable by a decoding system while still being masked by the masking signal (Col. 1, lines 59-64).

Regarding Claims 7 and 18, Neubauer a method and system of decoding an enhanced acoustic transmission signal including a modulated carrier signal formed by modulating a carrier signal at a carrier frequency with a data signal representing data, a masking signal adapted to mask the modulated carrier signal from being audible by a human ear, and an audio signal modified so that a frequency band surrounding the carrier frequency is removed from the audio signal, the method and system comprising: receiving the enhanced acoustic transmission signal (Fig. 4, 400); filtering the enhanced acoustic transmission signal to isolate the modulated carrier signal from the masking signal and the audio signal of the enhanced acoustic transmission signal (filter 402, Col. 13, lines 5-11); demodulating the modulated carrier signal to extract the data signal from

the modulated carrier signal (408); and decoding the data signal to extract the data (412).

Regarding Claims 8 and 19, Neubauer further discloses the modulated carrier signal is isolated from the masking signal by using a finite impulse filter (FIR filter 408).

Regarding Claim 16, Neubauer further discloses the modulated carrier signal and the masking signal are first combined to form a masked encoded signal (Fig. 1, output of 110), then the audio signal is combined with the masked encoded signal to form the enhanced acoustic transmission signal (112).

Regarding Claim 17, Neubauer further discloses the modulated carrier signal, the masking signal, and the audio signal are combined simultaneously to form the enhanced acoustic transmission signal (112).

Regarding Claims 21 and 25, Neubauer discloses a system and method of generating and receiving an enhanced acoustic transmission signal, the method comprising: generating a carrier signal ($\cos \omega_T t$); receiving data and generating a data signal representing the data (104); modulating the carrier signal with the data signal to form a modulated carrier signal at a carrier frequency (modulator 110); generating a masking signal to mask the modulated carrier signal from being audible by a human ear (106); receiving audio and generating an audio signal based on the audio (Input to 100), wherein a frequency band surrounding the carrier frequency is removed from the audio signal (Neubauer discloses dictating which energy level the signal may be applied to remain non-audible, Col. 10, lines 50-55); and combining the modulated carrier signal, the masking signal, and the audio signal to form the enhanced acoustic transmission

signal (112).; transmitting the enhanced acoustic transmission signal over a communication channel (Fig. 4, discloses microphone 400 to receive signal); receiving the enhanced acoustic transmission signal from the communication channel (microphone 400); filtering the enhanced acoustic transmission signal to isolate the modulated carrier signal from the masking signal and the audio signal of the enhanced acoustic transmission signal (filter 402, Col. 13, lines 5-11); demodulating the modulated carrier signal to extract the data signal from the modulated carrier signal (408); and decoding the data signal to extract the data (412).

Regarding Claim 22, Neubauer further discloses the modulated carrier signal and the masking signal are first combined to form a masked encoded signal (Fig. 1, output of 110), then the audio signal is combined with the masked encoded signal to form the enhanced acoustic transmission signal (112).

Regarding Claim 23, Neubauer further discloses the modulated carrier signal, the masking signal, and the audio signal are combined simultaneously to form the enhanced acoustic transmission signal (112).

Regarding Claims 24 and 29, Neubauer further discloses the carrier signal is isolated from the masking signal by using a finite impulse response filter (Fig 4. FIR filter 408).

Regarding Claim 26, Neubauer discloses the carrier signal is a sine wave ($\cos \omega_T t$).

Regarding Claim 28, Neubauer discloses the masking signal is narrowband random noise (Col 10, lines 61-64).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neubauer as applied to claims 1 and 15 above in view of Boney et al. ("Boney") (1996 IEEE International Conference on Multimedia Computing and Systems, Jun. 17-23, Hiroshima, Japan; Laurence Boney et al.; "Digital Watermarks for Audio Signals", pp 473-480.).

Neubauer discloses a method and system as stated apropos of claims 1 and 15 above but does not disclose the masking signal has a bandwidth less than one critical band of the modulated carrier signal. Boney also discloses inband coding of data in an audio signal and teaches that the critical bands are defined around a center frequency in which the noise bandwidth is increased until there is just noticeable difference in the tone at the center frequency. Thus if a faint tone lies in the critical band of a louder tone, the faint tone will not be perceptible (pg. 475, Col.1, first paragraph under heading 2.2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a masking signal bandwidth less than one critical band

f the carrier signal in order to prevent the masking signal from being perceptible as taught by Boney.

6. Claims 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neubauer as applied to claims 9 and 18 above in view of Boney et al. ("Boney") (1996 IEEE International Conference on Multimedia Computing and Systems, Jun. 17-23, Hiroshima, Japan; Laurence Boney et al.; "Digital Watermarks for Audio Signals", pp 473-480.). Neubauer discloses a method and system as stated apropos of claims 9 and 18 above including a microphone to receive audio (Fig. 4, microphone 400) and a data input device (Fig. 1, 104). Neubauer does not disclose the system is a telephone system. Boney also discloses inband coding of data in an audio signal and telephone speech signals from 50-7000 Hz. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the system as disclosed by Neubauer over a telephone system to transmit audio and data signals over a distance.

7. Claims 3, 11, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neubauer as applied to claims 9 and 18 above in view of Bassani et al. ("Bassani") (US Patent 4,035,838). Neubauer discloses a system and method as stated apropos of claim 3, 11, and 27 but does not disclose the carrier signal being a pulsed wave. It is well known in the art that variety of modulation techniques can be used to modulate signals including pulse-modulation. Bassani discloses pulse

modulation to transmit data over a carrier wave (Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use pulse modulation to transmit data over a signal.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (703)305-5598. The examiner can normally be reached on 8 Hours, 5 day/week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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XU MEI
PRIMARY EXAMINER